

CLAIMS

What is claimed is:

1. A method for preparing a substrate, the method comprising:
applying a colloidal solution comprising particles and a solvent to a substrate;
drying the colloidal solution, wherein the particles remain on the substrate;
and
sintering the particles;
wherein the substrate comprises a first electrode or a first electrolyte and
wherein the particles comprise a second electrode or a second electrolyte.
2. The method of claim 1 further comprising applying a second colloidal solution comprising second particles and a second solvent to the substrate, and drying the second colloidal solution, wherein the second particles remain on the substrate.
3. The method of claim 2 wherein the second particles are smaller than the first particles.
4. The method of claim 2 wherein at least a portion of the particles comprise substantially the same material as the substrate.
5. The method of claim 1 wherein the substrate comprises an electrode and the particles comprise an electrolyte.
6. The method of claim 1 wherein the substrate comprises a first electrolyte and the particles comprise a second electrolyte.

7. The method of claim 1 wherein the substrate comprises copper-substituted bismuth vanadate, and the particles comprise a material selected from the group consisting of SDC, GDC, YSZ, and ScZ.

8. The method of claim 1 wherein the substrate comprises a material selected from the group consisting of GDC and SDC, and the particles comprise a material selected from the group consisting of YSZ and ScZ.

9. The method of claim 1 wherein the substrate is porous and the size of the average diameter of the particles is larger than the average diameter of the pores.

10. A method for depositing material onto a fuel cell electrode, the method comprising:

- applying a colloidal solution comprising particles and a solvent to the fuel cell electrode;
 - drying the colloidal solution, wherein the particles remain on the fuel cell electrode; and
 - sintering the particles;
- wherein the particles comprise an electrode or an electrolyte.

11. The method of claim 10 further comprising applying a second colloidal solution comprising second particles and a second solvent to the fuel cell electrode, and drying the second colloidal solution, wherein at least a portion of the second particles remain on the fuel cell electrode.

12. The method of claim 11 wherein the second particles are smaller than the first particles.

13. The method of claim 11 wherein at least a portion of the particles comprise substantially the same material as the fuel cell electrode.

14. The method of claim 10 wherein the particles comprise an electrolyte.
15. The method of claim 10 wherein the particles comprise a second electrolyte.
16. The method of claim 10 wherein the electrode comprises copper-substituted bismuth vanadate and the particles comprise a material selected from the group consisting of SDC, GDC, YSZ, and ScZ.
17. The method of claim 10 wherein the fuel cell electrode comprises a material selected from the group consisting of GDC and SDC, and the particles comprise a material selected from the group consisting of YSZ and ScZ.
18. The method of claim 10 wherein the electrode is porous and the size of the average diameter of the particles is larger than the average diameter of the pores.
19. A method for applying a first electrode or a first electrolyte to a substrate, the method comprising:
 - steps for applying a suspension to the substrate, wherein the suspension comprises a solvent and a first electrode or a first electrolyte and wherein the substrate comprises a second electrode or a second electrolyte; and
 - steps for drying the substrate, wherein at least a portion of the first electrode or the first electrolyte is deposited on the substrate.
20. The method of claim 19 further comprising steps for applying a second suspension comprising a third electrode or a third electrolyte and a second solvent to the substrate, and steps for drying the second suspension, wherein at least a portion of the third electrode or a third electrolyte remain on the substrate.

21. The method of claim 20 wherein the third electrode or the third electrolyte is smaller than the first electrode or first electrolyte.
22. The method of claim 20 wherein at least a portion of the first electrode or first electrolyte comprise substantially the same material as the substrate.
23. The method of claim 19 wherein the substrate comprises an electrode and the suspension comprises an electrolyte.
24. The method of claim 19 wherein the substrate comprises a second electrolyte and the suspension comprises a first electrolyte.
25. The method of claim 19 wherein the substrate comprises copper-substituted bismuth vanadate and the suspension comprises a material selected from the group consisting of SDC, GDC, YSZ, and ScZ.
26. The method of claim 19 wherein the substrate comprises a material selected from the group consisting of GDC and SDC, and the particles comprise a material selected from the group consisting of YSZ and ScZ.
27. The method of claim 19 wherein the substrate is porous and the size of the average diameter of the first electrode or a first electrolyte is larger than the average diameter of the pores.